

REMARKS/ARGUMENTS

Applicant would like to thank the Examiner for the careful consideration given the present application. Reconsideration of the subject patent application in view of the present remarks is respectfully requested.

Claims 1, 21, 50-51 and 53-54 are amended.

Interview

An applicant initiated an interview occurred on December 7, 2010. The examiner Brent T. O Hern, and Applicant's attorney Nobuhiko Sukenaga participated in the interview. Possible amendments to overcome the rejection of record were discussed in the interview.

Claim Objections

Claim 21 is objected to because of the informalities. Claim 21 has been amended to correct the informalities. Thus, the objection as it applies to claim 21 should be withdrawn.

Claim Rejections - 35 USC § 112

Claims 1-3, 11-19, 21-29, 31-36, 38, and 50-54 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Claims 1, 50-51 and 53-54 have been amended to comply with 35 U.S.C. 112, first paragraph. Supports for the amended phrases "wherein said armouring layers are not bonded to said polymer layer, and said armouring layers are not bonded to each other" in each of claims 1, 50-51 and 53-54 are found

on page 1, lines 25-29 which describes, "The term "unbonded" means in this text that at least two of the layers including the armouring layers and polymer layers are not bonded to each other. In practice the pipe will comprise at least two armouring layers, which are not bonded to each other directly or indirectly via other layers along the pipe." Claims 2-3, 11-19, 21-29, 31-36, and 38 are directly or indirectly dependent from claim 1. Claim 52 is dependent from claim 50. Thus, the rejection as it applies to claims 1-3, 11-19, 21-29, 31-36, 38, and 50-54 should be withdrawn.

Claim Rejections - 35 USC § 103

Claims 1-3, 11-19, 21-29, 31-36, 38, and 50-54 are rejected under 35 U.S.C. 103(a) as being obvious over Glejbol et al. (WO 01/51839; hereinafter "Glejbol ('839)") in view of Hardy (US 5,514,312; hereinafter "Hardy ('312)") and Procida et al. (US 2001/0021426; hereinafter "Procida ('426)"). Applicants respectfully request withdrawal of the rejection for at least the following reasons.

Regarding the amended claim 1, none of Glejbol ('839), Hardy ('312) and Procida ('426), alone or in combination, discloses, teaches or renders foreseeable at least one film layer having a thickness of greater than 0 mm and 1 mm or less and said polymer layer being bonded to said film layer via one or more bondings selected from the group of chemical bondings and physical bondings, wherein said film layer and said polymer layer are of different materials.

Supports for the phrase "wherein said film layer and said polymer layer are of different materials" are evident from the fact that the thinner film layer should provide a higher diffusion barrier than the thicker polymer layer. This correlation is only possible when the film layer and the polymer layer are of different materials.

(1) Thickness limitation of the film layer

The Office action states that Procida's ('426) 2 mm film is similar to a 1 mm film when compared to a pipe having a diameter of 508 mm and it would have been obvious to provide a thickness as thin as possible to reduce costs and materials as long as the film layer is effective. Applicants respectively disagree.

Procida ('426) describes, "In samples of said liner, cut in chop form of a thickness of approx. 2.0 mm in longitudinal direction, as provided by the ASTM 638 standard" (the paragraph [0091]). Procida ('426) also describes, "Extrusion was effected on a 15.25 cm (6 inches) metal carcass having a 15.25 cm inner diameter. Extrusion is effected at a thickness of approx. 7 mm" (the paragraph [0088]) These disclosures indicate that Procida's ('426) 2 mm film (alleged by the examiner) is only a sample of the liner extruded at a thickness of approx. 7 mm. Thus, Procida ('426) does not disclose that the thickness of the film layer bonded to the polymer layer in a flexible unbonded pipe is approx. 2.0 mm, but merely discloses that the liner extruded at a thickness of approx. 7 mm is cut into a sample having a thickness of approx. 2.0 mm for the ASTM 638 testing.

Also, Procida ('426) describes, "thin samples of a thickness of approx. 1 mm are cut out of the barrier layer by use of a knife" (the paragraph [0082]). For the same reason as discussed above, Procida ('426) does not disclose that the thickness of the film layer bonded to the polymer layer in a flexible unbonded pipe is approx. 1.0 mm, but merely discloses that the barrier layer extruded at a thickness of about 8 mm (the paragraph [0077]) is cut into a sample having a thickness of approx. 1.0 mm for the ASTM testing.

It would not have been obvious to provide a film layer having a thickness of greater than 0 mm and 1 mm or less from the liner having a thickness of approx. 7 mm or the barrier layer having a thickness of about 8 mm disclosed in Procida ('426). A thickness of 7 mm or 8 mm film is not similar to a 1 mm film, even when compared to a pipe having a diameter of 508 mm.

The purpose of making the thickness of the film layer in the range of greater than 0 mm and 1 mm or less is to provide a high dynamic flexibility while keeping a high barrier against aggressive fluids. It is not just to reduce costs and materials alleged by the examiner. The present inventors have unexpectedly found that it is possible to make the thickness of the film layer in a range of 1 mm or less by providing the polymer layer being at least 10 times as thick as the film and being bonded to the film layer via one or more bondings selected from the group of chemical bondings and physical bondings, and by making the armouring layers unbonded to the polymer layer and to each other. The claimed invention has an unexpected effect of providing a high dynamic flexibility while keeping a high barrier against aggressive fluids.

In addition, Glejbol ('839) and Hardy ('312) are silent about the thickness of the film layer being greater than 0 mm and 1 mm or less.

(2) Bonding limitation of the polymer layer to the film layer.

The Office action states that Glejbol ('839) discloses inner multilayer liner #3 wherein the layers are extruded on the outside of one another and this extrusion is interpreted as creating chemical and/or physical bonds between the polymer/film layers. However, there is no disclosure in Glejbol ('839) that a film layer and a polymer layer are of different materials and the polymer layer is bonded to the film layer via one or more bondings selected from the group

of chemical bondings and physical bondings. The examiner argues that the extrusion of the layers of the inner multilayer liner #3 on the outside of one another and this extrusion is interpreted as creating chemical and/or physical bonds therebetween. However, the present invention requires that the film layer and the polymer layer are of different materials. If one layer is extruded on the other layer which is of a different material from the one layer, the mere extrusion does not create chemical and/or physical bonds therebetween. A co-extrusion of the materials of different compositions is very likely result in layers with poor bonding to each other. Glejbol ('839) fails to disclose that the layers of the inner multilayer liner #3 are of different materials and are extruded to create chemical and/or physical bonds therebetween.

The Office action also states that Hardy ('312) teaches the film layer comprises C atoms, the polymer being a cross-linked polymer with bondings linking to the C-atoms of the film layer (See col. 14, ll. 12-42 where the film layer is cross-linked PE with C atoms). Applicants respectfully disagree. Hardy ('312) merely discloses that layer 12 is advantageously produced by extrusion from the granulated mixture to be crosslinked (col. 14, ll. 21-22). The fact that the layer 12 is produced from a crosslinked granulated mixture does not mean that any one layer of the layers 12-17 of Hardy ('312) is bonded to any other layer of the layers 12-17 of Hardy ('312) via C-atom. The use of the crosslinked mixture for the layer 12 merely indicates that there are crosslinkings inside the layer 12. It does not mean that there is any interlayer crosslinking or bonding. Hardy ('312) fails to disclose any interlayer bonding between the layers 12-17.

Procida ('426) is merely cited for the thickness of the film layer. Procida ('426) does not disclose that said polymer layer being bonded to said film layer via one or more bondings selected from the group of chemical bondings and physical bondings, wherein said film layer and

said polymer layer are of different materials. The Office action states that the layers can be coextruded, extruded into or onto other layers or prepared individually and subsequently united. However, as discussed above regarding Glejbol ('839), a co-extrusion of the materials of different compositions is very likely result in layers with poor bonding to each other. The other methods do not always create the above bondings, especially when the film layer and the polymer layer are of different materials. Thus, the fact that the layers can be coextruded does not indicate that the polymer layer is bonded to the film layer via one or more bondings selected from the group of chemical bondings and physical bondings.

Accordingly, the combination of Glejbol ('839), Hardy ('312) and Procida ('426) does not meet all of the limitations of claim 1. Therefore, the asserted combination of Glejbol ('839), Hardy ('312) and Procida ('426) does not render claim 1 obvious. Thus, withdrawal of the rejection as it applies to claim 1 is respectfully requested.

Claims 2-3, 11-19, 21-29, 31-36 and 38 which are directly or indirectly dependent from claim 1 should be allowable for at least the same reason as claim 1.

Regarding the amended claims 50-51 and 53-54, none of Glejbol ('839), Hardy ('312) and Procida ('426), alone or in combination, discloses, teaches or renders foreseeable said polymer layer being bonded to said film layer via one or more bondings selected from the group of chemical bondings and physical bondings, wherein said film layer and said polymer layer are of different materials, as discussed above regarding the amended claim 1, "(2) Bonding limitation of the polymer layer to the film layer".


Claim 52 which is dependent from claim 50 should be allowable for at least the same reason as claim 50.

In consideration of the foregoing analysis, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. NKTR-46238.

Respectfully submitted,

PEARNE & GORDON LLP

By: 
Nobuhiko Sukenaga, Reg. No. 39446

1801 East 9th Street
Suite 1200
Cleveland, Ohio 44114-3108
(216) 579-1700

Date: January 27, 2011